

CASE STUDY / HVAC RETRO-COMMISSIONING

bioMérieux

Retro-commissioning uncovers major efficiency gains across complex lab and support spaces at a pharmaceutical manufacturing campus.

LOCATION
Durham,
North Carolina

FACILITY
Pharmaceutical
Manufacturing
Campus

ENGAGEMENT
Retro-
Commissioning

SOLUTIONS
HVAC
Optimization

YEAR 1 SAVINGS

\$236K

per year

Year-one utility cost savings across all campus buildings

CO2 AVOIDED

1,800

metric tons

Annual CO2 avoided in Year 1 through efficiency improvements

PROJECT INVESTMENT

\$200K

total

Total project investment with a simple payback of 0.85 years

Overview

To advance its commitment to energy efficiency and carbon reduction, BioMérieux partnered with Optimum Energy to expand beyond OptimumLOOP® chilled water optimization into a full retro-commissioning study addressing both supply and demand sides of its 295,000-square-foot pharmaceutical manufacturing campus.

What began as an exploratory review quickly developed into a full-scale project spanning laboratory, administrative, warehouse, packaging, and R&D facilities. The assessment revealed extensive simultaneous heating and cooling, suboptimal control sequences, and faulty hardware, leading to a phased program delivering \$236,000 in Year 1 savings on a \$200,000 investment.

The Challenge: Eliminate Simultaneous Heating and Cooling Waste Across a Complex Campus

The 295,000 sq ft campus presented a classic retro-commissioning challenge: labs, warehouses, and administrative offices all served by aging control sequences that had drifted from original design intent. The core issue was extensive simultaneous heating and cooling, where VAV reheat coils actively heated supply air the cooling system had just conditioned.

Combined with a stuck valve and suboptimal sequences across 14 AHUs and 154 terminal units, energy was being wasted continuously at scale.

The Solution: A Four-Month Phased Retro-Commissioning Program Targeting Highest-Impact Fixes

Over four months, the Optimum Energy Engineering Solutions team worked systematically across all building types, prioritizing the highest-impact fixes first and layering in controls optimization to deliver sustained savings well beyond the project timeline.

- Phase 1: Occupancy scheduling, setpoint resets, and ventilation adjustments
- Phase 2: Control logic corrections; stuck valve repaired; 154 terminal units reprogrammed
- Phase 3: Unnecessary reheat eliminated, economizers properly sequenced
- Dynamic setpoint resets implemented across all 14 AHUs

Projected Results

The program delivered \$236,000 in Year 1 savings, a 0.85-year payback, and avoided 1,800 tons of CO2.

DETAILS

bioMérieux

A global leader in in vitro diagnostics with a pharmaceutical manufacturing campus in Durham, NC spanning 295,000 sq ft across administrative, lab, warehouse, packaging, and R&D buildings.

SCOPE OF WORK

- Engineering analysis of 295,000 sq ft across 5 building types
- 14 AHUs optimized (supply air temp, static pressure, economizer)
- 154 terminal units reprogrammed (VAV and FPVAV with reheat)
- Occupancy schedules implemented across all buildings
- Stuck valve corrected; hardware deficiency log developed
- Dynamic setpoint resets and control logic tuning

YEAR 1 RESULTS

Year 1 Utility Savings	\$236,000
CO2 Avoided (Year 1)	1,800 metric tons
Terminal Units Reprogrammed	154
AHUs Optimized	14

PROJECT FINANCIALS

Project Investment	\$200,000
Simple Payback	0.85 years

"By responding swiftly to BioMérieux's decarbonization roadmap, OE uncovered and eliminated the single largest energy wasters (reheat loops and a stuck valve) before any major equipment work began. With that foundation in place, SVT adjustments, dynamic setpoint resets, and precise control re-sequencing have driven significant, verifiable energy savings."

— Optimum Energy Engineering Solutions Team

Year 1 utility savings reflect verified results from the four-month retro-commissioning program targeting completion July 2025. CO2 figures calculated using regional grid emissions factors.